

Topics in algebra and analysis

2 units (selection)

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Target We will learn some important properties of a special function, which is called the Riemann zeta function. Further we will learn how to solve problems produced by this function.

Outline We will learn development of mathematical tools in order to prove some properties of the Riemann zeta function, such as the special values, Euler product and the functional equation.

Fundamental Lecture “Basic Mathematics/Calculus 1”(1.0), “Basic Mathematics/Calculus 2”(1.0), “Complex Analysis”(1.0)

Relational Lecture “Numerical Analysis”(0.5)

Goal We will learn fundamentals of modern abstract mathematics and realize its effectiveness.

Schedule

1. Introduction
2. Zeta function
3. Leonhard Euler
4. Special values
5. Analytic continuation
6. Special values and analytic continuation
7. Euclid’s proof
8. Fermat prime
9. Euler product
10. Prime number theorem I
11. Prime number theorem II
12. Prime number theorem III
13. Functional equation I
14. Functional equation II
15. Summation
16. Assignments

Evaluation Criteria Evaluation will be based on assignments.

Reference Dunham, William, “Euler: the Master of Us All”, The Mathematical Association of America

Contents <http://cms.db.tokushima-u.ac.jp/cgi-bin/toURL?EID=216750>

Contact

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